

H.S. John.

# Rhodora

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CONTENTS:

Polystichum mohrioides. Dwarf Antennarias. Representatives of Arnica alpina. <i>M. L. Fernald</i> .....	89
Reports on the Flora of the Boston District,—XLVI.....	108
Field Meeting of the Josselyn Botanical Society. <i>Lena Willis</i>	112

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF  
HARVARD UNIVERSITY.—NEW SERIES.—No. LXXII.

M. L. FERNALD.

I. POLYSTICHUM MOHRIOIDES AND SOME OTHER  
SUBANTARCTIC OR ANDEAN PLANTS IN  
THE NORTHERN HEMISPHERE.

POLYSTICHUM MOHRIOIDES (Bory) Presl, var. **scopulinum** (D. C. Eaton), n. comb. *Aspidium aculeatum*, var. *scopulinum* D. C. Eaton, Ferns of N. A. ii. 125, t. lxii. fig. 8 (1880). *P. scopulinum* (D. C. Eaton) Maxon, Fern Bull. viii. 29 (1900). *P. aculeatum scopulinum* (D. C. Eaton) Gilbert, List N. A. Pterid. 20 (1901). *P. Lonchitis*, var. *scopulinum* (D. C. Eaton) Jones, Bull. Univ. Mont., Biol. Ser. xv. 7 (1910).

After several times collecting and studying during a period of nearly twenty years this anomalous plant, which has been treated as a variety of *Polystichum aculeatum* or of *P. Lonchitis*, as *P. mohrioides* and as a distinct species standing midway between *P. aculeatum* and *P. mohrioides*, I find myself firmly convinced that its relationship is primarily with the latter plant and that it is at best a northern variety of that wide-ranging austral species. *P. mohrioides* was discovered on the Falkland Islands (les Malouines) by D'Urville & Lesson during the voyage around the world of the French corvette, La Coquille. It was described by Bory de St.-Vincent as *Aspidium Mohrioides* and beautifully illustrated.<sup>1</sup> Gradually our knowledge of the plant has been extended and *P. mohrioides* in one form or another has been found to have a wide and very distinctive range, one which, with some modifications, is duplicated in several other groups of plants.

<sup>1</sup> Bory in Duperrey, Voyage autour du Monde sur La Coquille, Bot. pt. 1: 267, t. 35, fig. 1 (1829).

West of the Falkland Islands it is found on Tierra del Fuego, whence it follows slightly northward on the high Andes as *P. mohrioides*, var. *plicatum* (Poeppig) Christensen<sup>1</sup> or *P. andinum* Phil., which differs from the Falkland plant only in its dwarf size (growing in exposed alpine habitats) and in the paler and thinner scales of the stipe. Skottsberg got a form of *P. mohrioides* on South Georgia, 800 miles (1290 km.) southeast of the Falklands; Moseley, during the voyage of the Challenger, collected an extreme form on Marion Island, 1200 miles (1930 km.) southeast of the Cape of Good Hope and more than 3000 miles (4800 km.) northeast of South Georgia; and the next year De l'Isle discovered the species on Amsterdam Island, more than 2000 miles (3200 km.) east of Marion Island. Northward, in the Andes, it occurs as *P. mohrioides*, var. *elegans* (Remy) Christensen<sup>2</sup> or *P. elegans* Remy, an extreme with longer and more divided pinnae.

In North America two members of this alliance are recognized: *P. Lemmoni* Underwood and *P. scopulinum* (D. C. Eaton) Maxon, both confined to arid regions of the Sierra Nevada-Cascade axis, with the exception of four isolated stations for the latter, one each in the Teton Mts. of Idaho, the Mission Mts. of Montana, the Wasatch Mts. of Utah and the Shickshock Mts. of Gaspé Co., Quebec. So close are these North American plants to those of the southern Andes and the Falklands that the late D. C. Eaton, after trying to find specific differences, described and illustrated<sup>3</sup> as typical *P. mohrioides* (or *Aspidium mohrioides*) the Californian *P. Lemmoni* and at the same time, in describing his *Aspidium aculeatum*, var. *scopulinum*, he surmised that it belonged with *P. mohrioides*, saying: "I have some doubt about the plant here named var. *scopulinum*, as it differs more from all the rest than any of them do from each other. It has a little the habit of *A. mohrioides*, but, though the specimens I have seen are old, they still keep in a degree the aculeate points of the present species."<sup>4</sup> And again he wrote that his var. *scopulinum* was "almost as much like *A. mohrioides* as it is like *A. aculeatum*, but as it has the lobes of the pinnae somewhat aculeate it is better to leave it with the latter species."<sup>5</sup> As already stated, Eaton had tried to find specific characters for *P. Lemmoni* but was unable to do

<sup>1</sup> Christensen, Arkiv för Bot. x. No. 2: 17 (1910).

<sup>2</sup> Christensen, l. c. (1910).

<sup>3</sup> Eaton, Ferns of N. A. ii. 251, t. lxxx. figs. 4-9 (1880).

<sup>4</sup> Eaton, l. c. 127, 128.

<sup>5</sup> Eaton, l. c. 254.

so, saying clearly of the Lemmon plant: "At first I believed it to be a distinct species."<sup>1</sup> Similarly the great Swiss specialist upon the ferns, Christ,<sup>2</sup> in monographing *Polystichum* § *Mohrioides* had no hesitation in treating *P. Lemmoni* as identical with *P. mohrioides* (which, as understood by him, was chiefly var. *elegans*).

In his discussion of the ferns of temperate South America collected by Skottsberg, Christensen<sup>3</sup> points out the important characters which separate *P. mohrioides* from *P. aculeatum* and its allies; namely, the fleshy texture, scaleless surfaces of the fronds, thick and flat ribs and the large and immersed stomata (so immersed that under a good lens the lower surfaces of the fronds appear pitted or punctate). The fleshy texture, flat ribs and punctate lower surfaces are all obvious enough in *P. scopulinum*, and the fronds are either with or without some scales on the lower surface, but this latter character is inconstant, some sheets of perfectly good *P. mohrioides*, var. *typicum* Christensen from the Falkland Islands (coll. Cunningham, January 21, 1868) before me showing numerous slender scales among the sori. The Cunningham specimens are quite like the original plate of *Aspidium mohrioides* and in outline, size, texture and punctuation they are so close to several North American specimens of *P. scopulinum* that only the keenest inspection reveals slight differences. Thus Parish's material from Snow Canyon, San Bernardino Co., California, is a very close match in all these characters for the Cunningham plant and for the original plate. All the Falkland material I have seen, however, has the basal scales of the stipe darker and firmer than in *P. scopulinum*, although the Fuegian specimens (var. *plicatum*) have them as pale and thin.

*P. scopulinum* is regularly defined as differing from *P. mohrioides* and *P. Lemmoni* in the sharper and more acicular tips of the upper lobes or teeth of the pinnae. In general this character holds, but in the Cunningham material from the type-region of *P. mohrioides* the teeth of the lower pinnae are quite as sharp as in some of the North American plants, while in the Parish material above cited only the lowest pinnae show the sharp teeth, the upper having them quite as blunt as in the most ideal *P. mohrioides* or in *P. Lemmoni*. Furthermore the plant of Marion Island has some of the pinnae quite as spinulose-toothed as in the most extreme *P. scopulinum*.

<sup>1</sup> Eaton, l. c. 128.

<sup>2</sup> Christ, *Ueber die australen Polystichum-Arten*. Arkiv för Bot. iv. No. 12: 1-3 (1905).

<sup>3</sup> Christensen, l. c. 18.

Reference has been made to the fact that neither D. C. Eaton nor Dr. Christ could distinguish *P. Lemmoni* from *P. mohrioides*, var. *elegans*. Well developed fronds of the two are almost identical and *P. Lemmoni* has the scaleless surfaces of theoretical *P. mohrioides*, and the pits in its lower faces are unusually conspicuous. In only one character, apparently, can the two be distinguished with satisfaction: in var. *elegans* the scales at the base of the stipe are castaneous and subcoriaceous as in typical *P. mohrioides*; in *P. Lemmoni* paler and thinner as in vars. *plicatum* and *scopulinum*. In their extremes *P. Lemmoni* and *P. mohrioides*, var. *scopulinum* are well differentiated, but certain small plants of the former too closely simulate plants of the latter with unusually pinnatifid pinnae; and in view of their both possessing the essential characters of *P. mohrioides* and the failure of the spinulose teeth of var. *scopulinum* to retain the constancy one might wish them to, it seems the part of sound classification to treat *P. Lemmoni* as

*P. MOHRIOIDES*, var. **Lemmoni** (Underw.), n. comb. *Aspidium mohrioides* D. C. Eaton, Ferns of N. A. ii. 251, t. lxxx. figs. 4-9 (1880), as to Lemmon plant figured. *P. Lemmoni* Underw. Our Nat. Ferns, ed. 6: 116 (1900).

Besides agreeing in all their fundamental specific characters, typical *P. mohrioides* and its vars. *scopulinum* and *Lemmoni* are amazingly similar in their selection of habitat. Bory's statement, based upon the observations of the original collectors of the Falkland plant, was that "elle croît dans les fentes des roches" and the latest statement, by Skottsberg, is similar: "Rocky places, often deep down in crevices," while in the "stone-runs" "Two ferns are found in solitary tufts between the blocks, *Blechnum magellanicum* and *Polystichum mohrioides*, both finely developed."<sup>1</sup> How strikingly like Eaton's account of the type-station of var. *Lemmoni*: "Mr. Lemmon writes that this fern grows in loose and moist granitic soil, the root-stocks hidden under rocks;"<sup>2</sup> or like Bradley's account of the type-region of var. *scopulinum* in the Teton Canon of Idaho: "we climbed a sharp slope of stumbling rubbish, and then found ourselves on a narrow crest, overlooking an immense cañon, the Great Teton Canon . . . . The descent from this crest is very steep; and, in dodging falling masses of rock, started by those behind him, Mr. Bechler unfortunately

<sup>1</sup> Skottsberg, *A Botanical Survey of the Falkland Islands*, Kungl. Svenska Vetenskapsakad. Handl. 1. No. 3: 9, 114 (1913).

<sup>2</sup> Eaton, I. c. 252 (1880).

got a severe sprain."<sup>1</sup> At the isolated stations at the head of Snow Brook and on the ragged walls of Devil's Gulch on Mt. Albert, Quebec, where I have several times collected the plant, var. *scopulinum* is in dry rock-crevices (serpentine) or under broken rock whence its tough roots are most difficult of extraction. In the latter situations, where the tallest and least plicate fronds naturally develop, the fronds are often badly broken by the shifting rock-debris.

The range of the aggregate-species, *Polystichum mohrioides*, is, as already stated, similar to the ranges of several other plants, although differing, naturally, in many details. Thus *Myriophyllum elatinoides* Gaudichaud occurs on New Zealand, Chatham Island, Tasmania, the Falkland Islands, in the Ardean region from Cape Horn to Ecuador, locally in Mexico, and it is known in the western United States in Arizona and Oregon.<sup>2</sup> *Empetrum rubrum* Vahl, characterized by white-woolly branchlets, leaves not reflexed in age and red drupes, occurs on the Falklands, along the Andes from Tierra del Fuego into Chile, on Masafera (the western island of the Juan Fernandez group), and 2500 miles (4025 km.) east of Patagonia on Gough Island and on the islands of the Tristan da Cunha group. Outside the Subantarctic and southern Andean regions the only Empetrum are the Arctic circumpolar *E. nigrum* L. with branchlets at most minutely puberulent, the leaves reflexed in age and the berries black or purplish; and two species centering on the Gulf of St. Lawrence, *E. Eamesii* Fernald & Wiegand and *E. atropurpureum* Fernald & Wiegand, both of which have the white-woolly branchlets, non-reflexed leaves and red berries as in the Subantarctic *E. rubrum* but differ from it in more trailing habit and in seed-characters.<sup>3</sup>

The quaint little genus *Lilaeopsis* of the *Umbelliferae* has three strongly marked species or groups of species. One, *L. lineata* (Michx.) Greene,<sup>4</sup> with the linear-clavate broadly round-tipped 3-6-jointed leaves scattered and solitary along the creeping filiform stem and

<sup>1</sup> Bradley in Hayden, U. S. Geol. Surv. of Terr. 6 Ann. Rep. 219 (1873).

<sup>2</sup> See Fernald, RHODORA, xxi. 124 (1919).

<sup>3</sup> For further discussion, see Fernald & Wiegand, RHODORA, xv. 213-217 (1913).

<sup>4</sup> It is probable that, when the original plant of *Hydrocotyle chinensis* L. Sp. Pl. i. 234 (1753) is critically examined, it will prove to be *Lilaeopsis lineata*, in which case we shall have to take up for the characteristic plant of Atlantic North America the highly inappropriate name *L. chinensis* (L.) Kuntze. The Linnean description strongly suggests *L. lineata*, although the phrase "Folia . . . saepius bina ad articulos" is not very satisfactory. No *Lilaeopsis* is known from Asia and Linnaeus evidently had his geographic data confused. His *Hydrocotyle chinensis* has generally been referred to the all-inclusive *L. lineata* (or *Crantzia lineata*), but it is worthy of note that upon examining the Linnean type Asa Gray made the memorandum "a species of *Crantzia*," not our species, with which he was familiar.

without obvious stipular margins, and with the fruits constricted at base or pyriform, is confined to saline mud of the Atlantic coast of the United States and of southwestern Nova Scotia. The second species *L. carolinensis* Coulter & Rose, a plant with long-petioled leaves having spatulate or oblong blades up to 2.5 cm. long and 1.5 cm. broad and comparatively large globose fruits, was originally described from the southeastern United States but it is apparently found also in Paraguay (for example, Hassler, no. 12,271) and elsewhere in temperate eastern South America.

The third and most widely spread group of species is typified by *L. attenuata* (Hook. & Arn.) Fernald,<sup>1</sup> a plant characteristic of southern South America and the Andes and represented northward by *L. occidentalis* Coulter & Rose and *L. Schaffneriana* (Schlecht.) Coulter & Rose and southward by the plants of the Falkland Islands, New Zealand, Tasmania and Australia which have erroneously passed as the Atlantic North American *L. lineata* or *Crantzia lineata* (Michx.) Nutt. The published illustrations<sup>2</sup> of fruits indicate considerable differences and it is possible that the austral series contains other species than *L. attenuata* and *L. Schaffneriana* but without better material than is now at hand it would be unwise to attempt further subdivision. The essential point in regard to the Australian, New Zealand, Tasmanian, Falkland, Argentine and Andean plants is, that they as well as the Mexican and Pacific North American plants all differ in fundamental characters from the Atlantic North American *L. lineata*; for in them all the more elongate and slender or often attenuate leaves are tufted along the comparatively stout creeping stem, not solitary and scattered as in *L. lineata*; when well developed they show 6–13 joints instead of only 3–6 (rarely 7) and they often have scarious stipular margins which frequently persist as old shreds. Whether they finally prove to be a single species, *L. attenuata*, or several, the plants of Subantarctic regions and of temperate and Andean South America constitute, with the Mexican and Pacific North American plants, a distinct section of *Lilaeopsis*.

It is thus evident that, although differing in details of distribution, *Polystichum mohrioides*, *Myriophyllum elatinoides*, the red-berried Empetrum and the species of *Lilaeopsis* centering about *L. attenuata*

<sup>1</sup> *LILAEOPSIS attenuata* (Hook. & Arn.), n. comb. *Crantzia attenuata* Hook. & Arn. in Hook. Bot. Misc. iii. 346 (1833).

<sup>2</sup> Hook. Fl. Antarct. ii. 287, t. C. (1847); Weddell, Chloris Andina, ii. t. 68 (1861); Coulter & Rose, Bot. Gaz. xxiv. 48, 49, figs. and 4 (1897); Jepson, Madroño, i. 139, fig. 25 (1923).

are similar in having interrupted Subantarctic and Andean ranges and in occurring in the northern hemisphere only in western America or in the region of the Gulf of St. Lawrence or in both areas.

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## II. THE DWARF ANTENNARIAS OF NORTHEASTERN AMERICA.

(Plate 142.)

The larger species of *Antennaria* of temperate eastern America are reasonably understood, but there is another series of highly localized species, chiefly of the calcareous areas from northern Labrador to Newfoundland, eastern Quebec and the James Bay region, which have not been so clearly defined. These are the plants which have passed chiefly as *A. alpina* (L.) Gaertn. and which, with it, form a rather natural group of species. In the cordilleran region of North America these plants have attracted much attention and a large number have been proposed as species. In eastern America they occur wholly beyond the habitations of resident botanists, unless we include in eastern America botanically quite similar Greenland. The Antennarias of Greenland have been carefully treated and beautifully illustrated by Porsild;<sup>1</sup> but in the region immediately to the west and southwest of Greenland these plants are collected only by the chance botanical visitor and our knowledge of them, like our knowledge of the whole vast region from Gaspé and Newfoundland northward, is in very rudimentary condition. However, the necessity of properly identifying two quite distinct species discovered in 1923 on the Shickshock Mountains makes it desirable to draw into convenient form our knowledge to date of these plants. The following synopsis of the species occurring south of Hudson Straits is therefore presented, not because it is final but because it may draw attention to a group about which much more information is needed. Further exploration of Newfoundland, Anticosti Island, the Gaspé Peninsula and the Labrador Peninsula will surely bring to light many additional species; and, to judge from our experience to date, they may be most hopefully looked for on barrens and mountains of limestone, basic schists and traps.

<sup>1</sup> Porsild, *On the Genus Antennaria in Greenland* (*Arbejder fra den Danske Arktiske Station paa Disko*, Nr. 9), *Meddel. om Groenl.* II. 267–281 (1915).

In order properly to orient the small-leaved boreal series here specially considered, the leading features of the other sections of the genus represented in eastern America are indicated in the key.

- a. Basal leaves<sup>1</sup> erect, oblanceolate to elliptic-acuminate, 2–16 cm. long, similar to the caudine ones: involucres of the pistillate heads brown to blackish: plants sparingly to not at all stoloniferous.
  - A. eucosma* Fernald & Wiegand and *A. pulcherrima* (Hook.) Greene.
- a. Basal leaves spreading, forming depressed rosettes, strongly contrasting in outline with the caudine leaves: plants humifuse or freely stoloniferous *b*.
  - b. Larger basal leaves only 1.5–5 mm. wide, blunt or barely short-mucronate *c*.
    - c. All the involucral bracts of the pistillate heads<sup>2</sup> deep-brown, drab or blackish *d*.
      - d. Bracts subequal, narrow; the inner linear or lanceolate and acute: heads 1–6 *e*.
      - e. Rosette-leaves terminated by a short but distinct glabrous mucro: corollas 3.5–5 mm. long *f*.
      - f. Rosette-leaves glabrous and bright-green or grayish-pubescent above: caudine leaves distant; the upper with an oblong glabrous scarious appendage: corollas 4–5 mm. long: pits of the denuded receptacle 20–30, 0.3–0.4 mm. broad, much broader than the intermediate ridges . . . . 1. *A. alpina*.
      - f. Rosette-leaves canescent: caudine leaves crowded; the upper with a lanceolate pubescent scarious appendage: corollas 3.5–4 mm. long: pits of denuded receptacle 60–100, 0.1 mm. broad, about as wide as the blunt-edged intermediate ridges . . . . 2. *A. Sornborgeri*.
    - e. Rosette-leaves canescent, blunt, the terminal mucro obsolete or in old weather-worn leaves barely visible: corollas 3–4 mm. long *g*.
      - g. Caudine leaves 9–15; the median and upper tapering to a slender subulate tip; only the very uppermost with a lanceolate scarious appendage . . . . 3. *A. cana*.
      - g. Caudine leaves 5–8; all but the lowermost with an oblong-lanceolate flat scarious tip 1.5–3 mm. long . . . . 4. *A. vexillifera*.
      - d. Bracts in about 5 outwardly shorter series, oblong, obtuse: head solitary . . . . 5. *A. pygmaea*.
    - c. At least the inner bracts of the pistillate heads with white or whitish tips: basal leaves whitened above with minute pubescence *h*.
      - h. The 1–3 uppermost caudine leaves with slender scarious terminal appendages: rosette-leaves blunt or short-mucronate: pistillate involucres 4–7 mm. high, with appressed-ascending bracts *i*.
      - i. Involucre of 4–6 series of distinctly unequal pale-brown bracts . . . . 6. *A. straminea*.

<sup>1</sup> By basal leaves are meant not only those of the basal rosette but the new broad leaves terminating the stolons or basal offshoots. On account of weathering the former are often bruised and uncharacteristic.

<sup>2</sup> The only species of this series of which staminate plants are known is *A. nitida*. The descriptions of all the others, therefore, are drawn only from pistillate plants.

- i. Involucre of 2–3 (–4) series of subequal or obscurely imbricated whitish, creamy or roseate bracts *j.*
- j.* Indument of the rosette-leaves close and lustrous as if varnished: cauline leaves 9–18: inflorescence glomerulate: corollas 3–3.5 mm. long *k.*
- k.* Upper cauline leaves with scarious tips 2–2.5 mm. long: involucre not viscid, with thin bracts; the thin tips of the inner series lacerate-erose..... 7. *A. albicans.*
- k.* All but the uppermost cauline leaf merely short-mucronate: involucre viscid-hirsute, with thick and firm bracts; the thick tips entire or merely crenulate..... 8. *A. nitida.*
- j.* Indument of the rosette-leaves a loose tomentum: cauline leaves 5–10: inflorescence a corymb: corollas 3.8–5 mm. long *l.*
- l.* Flowering stems 3–7 cm. high, not glandular: the upper cauline leaves with oblong-lanceolate scarious appendages 2–3 mm. long: heads 2–5: involucre not glandular: achenes smooth.. 9. *A. Peasei.*
- l.* Flowering stems 0.5–1.5 dm. high, glandular-hirsute above: upper cauline leaves with subulate or involute tips: heads 3–9: involucre glandular-viscid: achenes papillose.. 10. *A. subviscosa.*
- h.* The 5–8 upper cauline leaves with broad flat scarious appendages: rosette-leaves mucronate: involucre (except for the whitish tips) fuscous, 6–8 mm. high, its bracts loosely spreading..... 11. *A. isolepis.*
- b.* Larger basal leaves mostly wider (rarely less than 5 mm. wide), distinctly mucronate or apiculate *m.*
- m.* Rosette-leaves comparatively small, 0.2–2.1 cm. wide, with only the midrib prominent to the tip beneath, the lateral ribs short and evanescent *n.*
- n.* Middle and upper cauline leaves terminated by a flat or merely involute scarious appendage.... *A. neglecta* Greene, *A. appendiculata* Fernald, *A. spathulata* Fernald, *A. canadensis* Greene.
- n.* Middle and upper cauline leaves subulate-tipped or mucronate, without a scarious appendage (except sometimes on the bracteal leaves of the inflorescence).... *A. petaloides* Fernald, *A. glabrifolia* Fernald, *A. neodioica* Greene.
- m.* Rosette-leaves comparatively large, 0.7–5.5 cm. broad, with 3–7 somewhat prominent ribs beneath .. *A. plantaginifolia* (L.) Richardson, *A. occidentalis* Greene, *A. fallax* Greene, *A. Brainerdii* Fernald, *A. Parlinii* Fernald, *A. solitaria* Rydberg.

1. *A. ALPINA* (L.) Gaertn. FIG. 1. Humifuse, with trailing subligneous branches up to 1 dm. long: stolons short and crowded: rosette-leaves oblanceolate, 0.8–1.8 cm. long, 1.5–4 mm. wide, narrowed to a distinct subulate-mucronate tip, bright green or canescent above: flowering stem slender, subflexuous, up to 2.3 dm. high: caulin leaves 4–13, becoming distant by elongation of the stem; the middle and upper with oblong glabrous scarious tips: pistillate heads 1–5, sessile or short-stalked: involucre 7–9 mm. high, lanate at base: bracts about 3-seriate, subequal; the outer lanceolate to oblong, fuscous, acuminate; the inner attenuate: corollas 4–5 mm. long: longer pappus-bristles 5–6 mm. long: achenes glabrous, 1.3–1.5 mm. long: pits of

*the denuded receptacle 20–30, 0.3–0.4 mm. broad, much broader than the intermediate ridges.*

Three varieties with us:

- Flowering stems 2–12 cm. high, with 4–9 leaves: heads (when more than 1) in a close corymb or glomerule.  
 Rosette-leaves green and glabrous above.....Var. *typica*.  
 Rosette-leaves canescent-tomentose above.....Var. *canescens*.  
 Flowering stems elongating to 2–2.3 dm., with 9–13 leaves: rosette-leaves green and glabrous above: heads 1–2, the lower (when present) on a pedicel 1–1.5 cm. long .....Var. *ungavensis*.

**Var. typica.** *Gnaphalium alpinum* L. Sp. Pl. ii. 856 (1753). *A. alpina* (L.) Gaertn. Fruct. ii. 410 (1791).—Arctic America, south to Kangalaksiorvik Bay, Labrador (*Owen Bryant*) and mountains of British Columbia; also northern Eurasia. Fl. July–September.

Var. CANESCENS Lange, Fl. Dan. xvi. (fasc. xlvii.) 9, t. 2786, fig. 1 (1869); Fernald, RHODORA, xviii. 237 (1916). *A. angustata* Greene, Pittonia, iii. 284 (1898). Var. *cana* Fernald & Wiegand, RHODORA, xiii. 24 (1911), in part.—The commoner extreme in eastern America, extending south to Port Manvers, Labrador (*Delabarre*).

Var. UNGAVENSIS Fernald, RHODORA, xviii. 238 (1916).—Known only from the type-region, Stillwater River, Ungava District.

2. A. SORNBORGERI Fernald. FIG. 2. Humifuse, with trailing subligneous branches up to 1 dm. long: stolons very short and crowded: rosette-leaves oblanceolate, 6–12 mm. long, 1.5–2 mm. wide, narrowed at summit to the short-mucronate tip, canescent-pannose: flowering stem stiffly erect, 0.4–1.1 dm. high: caulin leaves rather crowded, 9–12, linear, 5–15 mm. long, 0.5–1.5 mm. wide; the upper with villous lanceolate scarious tips: pistillate heads 1–3, sessile, campanulate: involucres 6–7 cm. high, lanate at base: bracts about 3-seriate, subequal; the outer lanceolate, brown; the inner linear-attenuate, yellowish-brown, erose-serrulate: corollas 3.5–4 mm. long: longer pappus-bristles 4–5.5 mm. long: achenes glabrous, 1.2–1.4 mm. long: pits of the denuded receptacle 60–100, 0.1 mm. broad, about as wide as the blunt-edged intermediate ridges.—RHODORA, xviii. 237 (1916).—Rama, LABRADOR (*J. D. Sornborger*). Fl. August.

3. A. CANA (Fernald & Wiegand) Fernald. FIG. 3. Humifuse, the crowded leafy stolons very short (up to 2 cm. long): rosette-leaves narrowly cuneate-obovate or broadly oblanceolate, obtuse, not mucronate, broad-based, 3–11 mm. long, 2–5 mm. broad, white above with dense minute tomentum: flowering stems 2.5–12 cm. high, slender: caulin leaves 9–15, rather crowded, linear; the lower 8–15 mm. long, 1–2 mm. broad, subulate-tipped; the median and upper subulate-tipped; only the uppermost with a lanceolate scarious tip: pistillate heads (1–)2–6, campanulate, corymbose, on pedicels up to 1 cm. long: involucres 5–7 mm. high, lanate at base: bracts 3-seriate, subequal, very thin; the outer oblong, brown; the inner lanceolate, tawny, slightly fimbriate: corollas 3.5–4 mm. long: longest pappus

4–5.5 mm. long: achenes glabrous, 1.2–1.6 mm. long: *pits of the mature denuded receptacle 60–100, 0.1 mm. broad, much broader than the acute intermediate ridges.*—RHODORA, xviii. 236 (1916). *A. alpina*, var. *cana* Fernald & Wiegand, RHODORA, xiii. 24 (1911), in part.—Dry limestone barrens, western NEWFOUNDLAND. Fl. July, early August.

4. *A. vexillifera*, spec. nov. (FIG. 4), humifusa, stolonibus foliosis confertis perbrevis (ad 2 cm. longis); foliis basalaribus late spathulatis vel cuneato-ovobovatis apice rotundatis vix mucronatis 5–12 mm. longis 3–4 mm. latis supra albidis, tomento denso minuto; caule florifero 6–10 cm. alto gracili; foliis caulinis 5–8 subdistantibus, imis oblanceolatis, mediis superioribusque linearibus 5–10 mm. longis cum apice scarioso oblongo-lanceolato 1.5–3 mm. longo munitis; capitulis femineis 1–5 corymbosis hemisphaerico-campanulatis basi rotundatis; involucro 6–7 mm. alto basi lanato; bracteis 2–3-seriatis subaequalibus tenuissimis, exterioribus anguste oblongis obtusis vel subacutis basi castaneis, interioribus lanceolatis fulvis plerumque acuminatis; corolla 3–4 mm. longa, lobis purpurascensibus; stylo purpurascenti; planta mascula ignota.—Matane County, QUEBEC: dry open gravel on the tableland-saddle (altitude about 1070 m.) between Mt. Mattaouisse and Mt. Collins, July 8, 1923, M. L. Fernald, Ludlow Griscom, K. K. Mackenzie, A. S. Pease & L. B. Smith, no. 26,056 (TYPE in Gray Herb.).

Closely simulating *A. cana* but at once distinguished by its cauline leaves. In *A. cana* these are 9–15, the median and upper ones tapering to a slender subulate tip, only the very uppermost with a scarious tip. In *A. vexillifera* the cauline leaves are fewer (5–8) and all but the very lowermost bear conspicuous broad pennant-like scarious tips (whence the specific name.)

*A. vexillifera* has the cauline leaf-tips of *A. alpina*, but that species has much narrower and distinctly mucronate basal leaves, larger heads with narrower and more fuscous involucral bracts and longer corollas (4–5 mm. long).

5. *A. PYGMAEA* Fernald. FIG. 5. Dwarf, 3–4.5 cm. high, monocephalous, humifuse; the assurgent stolons very short, not obviously elongated: basal leaves oblanceolate, mucronate, 8–14 mm. long, 2.5–3.5 mm. wide, glabrous or glabrate above; the cauline about 9, crowded, linear-oblanceolate, 6–14 mm. long, lanate beneath, glabrous or glabrate above, with a lanceolate or narrowly deltoid glabrous flat scarious tip 1.5–2 mm. long: pistillate involucre hemispherical, 7 mm. high, 12–13 mm. broad (in the dried material), lanate at base: bracts in about 5 series, definitely imbricated, oblong, obtuse; the outer fuscous, with a short stramineous tip; the inner with a long obtuse stramineous tip; corollas 4 mm. long: staminate plant unknown.—RHODORA, xvi. 129

(1914).—Known only from northeastern LABRADOR<sup>1</sup> (*Weitz et al.*). *Fl.* August.

6. A. STRAMINEA Fernald. FIG. 8. Plant humifuse, the leafy stolons very short or slightly elongated (up to 7 cm. long): *leaves of the rosette spatulate*, subacute, barely mucronate, 5–12 mm. long, 2–4 mm. broad, white above with dense fine tomentum: *flowering stem* 3–14 cm. high, slender, remotely leafy: *cauline leaves* 8–10, linear, 6–14 mm. long, 1–2 mm. wide; the median attenuate to a dark subulate tip; *the upper with a linear scarious tip*: pistillate heads 1–7, usually in a close corymb, hemispheric-campanulate, rounded at base: *involucre* 5.5–7 mm. high, 4.5–8 mm. broad (in the dried specimens), with 4–6 series of very distinctly imbricated bracts: *the outer bracts* olate or oblong, brown, slightly lanate at base, with a thin chartaceous stramineous obtuse or subacute tip; the median oblong, with a deltoid obtuse or subacute stramineous tip; the inner with a lanceolate erose stramineous tip: corollas 3.7–4.2 mm. long: achenes glabrous, 1.4 mm. long: longer pappus-bristles 4.5–5 mm. long: style yellowish, becoming brown: staminate plant unknown.—RHODORA, xvi. 130 (1914).—Rocky or turfly calcareous barrens and headlands bordering Notre Dame and Ingornachoix Bays, NEWFOUNDLAND. *Fl.* July, early August.

7. A. ALBICANS Fernald. FIG. 6. Plant humifuse, the leafy stolons very short (up to 2 cm. long): *basal leaves spatulate*, subacute or obtuse, scarcely mucronate, 3–8 mm. long, 2–3 mm. wide, white above with dense minute somewhat shining tomentum: *flowering stem* 4.5–9 cm. high, slender, somewhat remotely leafy: *cauline leaves* 9–15, linear, 6–12 mm. long, 1–2 mm. wide; the median attenuate, subulate at tip; *the upper with a glabrous linear scarious tip* 2–2.5 mm. long: pistillate heads (1)–2–5 in *glomerules*, turbinately-campanulate: *involucre*

<sup>1</sup> As noted when *A. pygmaea* was published, this is the plant which Gray in the *Synoptical Flora* treated as *A. carpathica* (Wahlenb.) R. Br.: "Labrador (a monocephalous form!)." But Gray, of course, was writing long before the intensive and highly productive studies of the genus had begun. *A. carpathica* belongs to the very strongly defined non-stoloniferous group of species with erect and elongate basal leaves (the section including *A. eucosma* Fernald & Wiegand, *A. pulcherrima* (Hook.) Greene, *A. lanata* (Hook.) Greene, etc.), while Gray's "monocephalous form" is a humifuse plant with depressed rosettes of tiny leaves. Dr. Theodor Holm, lamenting the disappearance of the name *A. carpathica* from American literature, cites Gray's record of the Labrador plant (*A. pygmaea*), which was not understood by Gray, as proof that *A. carpathica* does grow in America, though in Labrador it so far departs from the European type as to have only a single head (RHODORA, xxii. 142); and he reinforces his argument, that *A. carpathica* is North American, by the statement that, "Having examined a number of specimens of *A. lanata* Greene I find it impossible to distinguish them from *A. carpathica*." I have before me 19 collections of *A. carpathica* of Europe and 26 of the Rocky Mountain *A. lanata*. In the former 2 to 4 of the median and upper cauline leaves end in a lance- or linear-subulate scarious tip, only 1 or 2 of the uppermost leaves ever showing dilated appendages; but in *A. lanata* 4 to 9 of the cauline leaves have broad and conspicuous pennant-like appendages. This perfectly obvious character, supplementing the broader leaves, the smaller heads, shorter corollas and shorter pappus, clearly distinguishes *A. lanata* from *A. carpathica* and it is doubtful if other students of *Antennaria* will follow Holm in forcing it and the wholly different *A. pygmaea* back into the European *A. carpathica*.

4.5–6 mm. high, 4.5–6 mm. wide (in dried specimens): *bracts* in 2–3 series, *subequal*, *thin*; the outer 3–4 mm. long, oblong or lanceolate, obtuse or subacute, straw-color or brown, green and a little lanate at base; *inner* oblong, obtuse, *lacerate-erose*, *milk-white*: *corollas* 3–3.3 mm. long: *achenes* glabrous, 0.8–1 mm. long: longer pappus-bristles 4–4.3 mm. long: staminate plant unknown.—RHODORA, xvi. 197 (1914).—Dry limestone shingle, northern domes of Table Mt., Port à Port Bay, NEWFOUNDLAND. Fl. July.

8. A. NITIDA Greene. FIG. 9. Resembling *A. albicans*. PISTILLATE PLANT with the stiffish stolons up to 6 dm. long: basal leaves 0.5–1.5 cm. long: flowering stems 0.5–2 dm. high: *cauline leaves* 9–18; *the middle and upper merely short-mucronate*: heads 5–9 in a glomerule: *involucre* 6–7 mm. high, *viscid-hirsute*: *bracts* about 4-seriate, *very unequal*; *the outer* 3–4.5 mm. long, oblong, obtuse, *whitish*, green and densely lanate at base; *the inner* white, gradually narrower, obtuse, *entire or barely erose*: *corollas* 3–3.5 mm. long: *achenes* 0.8–1.2 mm. long: longest pappus-bristles 5 mm. long. STAMINATE PLANT with glomerules 1–2 cm. in diameter: involucre with firm creamy or yellowish oblong to obovate entire to merely crenulate bracts: corollas 3.5 mm. long: pappus 4–4.5 mm. long, upwardly barbellate; the slightly dilated (rarely broad) tips crenate.—Pitttonia, iii. 283 (1898). *A. arida viscidula* E. Nelson, Proc. U. S. Nat. Mus. xxiii. 710 (1901). *A. viscidula* Rydberg, Fl. Colo. 369 (1906).—Dry limestone soil, Charlton Isl., James Bay, QUEBEC to ATHABASCA and UTAH. Fl. late June, July.

9. A. Peasei, spec. nov. (FIG. 11), humifusa, stolonibus foliosis confertis perbrevis (ad 2 cm. longis); foliis basilaribus late oblanceolatis vel anguste cuneato-ovobovatis 7–12 mm. longis 2–4.5 mm. latis mucronatis supra albidis, tomento denso minuto; caule florifero 3–7 cm. alto gracili; foliis caulinis 5–7 linear-lanceolatis 0.8–1.5 cm. longis, imis mediisque subulato-mucronatis, superioribus 2 vel 3 apice scarioso oblongo-lanceolato 2–3 mm. longo munitis capitulis femineis 2–5 dense corymbosis hemisphaericō-campanulatis basi rotundatis; invo ucro 6–7 mm. alto basi lanato; bracteis 2–3-seriatim subaequalibus chartaceo-petaloideis, exterioribus oblongis subacutis pallide brunneis basi subcastaneis, interioribus similibus acuminate lacteis; corollis 3.8–5 mm. longis; stylo purpurascens; achaeniis glabris; planta mascula ignota.—Matane County, QUEBEC: talus of mica-schist, chimney east of Razorback Ridge (altitude 850–1000 m.), Mt. Logan, July 13, 1923, A. S. Pease & L. B. Smith, no. 26057 (TYPE in Gray Herb.).

Related to *A. albicans* of western Newfoundland and *A. subviscosa* of Rimouski County, Quebec. From the former distinguished by the distinctly mucronate and loosely tomentose basal leaves, the few cauline leaves, the larger heads, the acuminate inner involucral bracts and the longer corolla; *A. subviscosa* is a coarser plant with trailing

branches often 4 or 5 dm. long. It has 7–9 caudine leaves, the uppermost with subulate or involute tips; its heads are more numerous (3–9) and its glandular-viscid involucres have more definitely imbricated bracts.

Various cordilleran species, *A. umbrinella* Rydberg, *A. pulrinata* Greene, etc., are related to *A. Peasei* but I am unable to find any species to which it can be satisfactorily referred.

10. *A. subviscosa* Fernald. FIG. 10. Plant densely humifuse, the trailing branches sublignous, often 4–5 dm. long; stolons very short and crowded: leaves of the rosettes spatulate, obtusish, scarcely mucronate or with a very short mucro, 0.5–1.5 cm. long, 2–5 mm. broad, densely white-tomentose: flowering stems 0.5–1.5 dm. high, white-tomentose throughout, glandular-hirsute above: caudine leaves 7–10, tomentose; the lower linear-oblanceolate, mucronate, 1.5–2.5 cm. long; the upper linear-attenuate, with a subulate or involute sub-scarious pubescent tip: pistillate heads 3–9, densely or loosely corymbose: involucre turbinate-campanulate, 5–6.5 mm. high: bracts about 3-seriate; the outer 3–4 mm. long, oblong, subherbaceous, greenish or stramineous, often rose-tinged, glandular-viscid, with a thin obtuse cream-colored or rose-pink tip; interior narrower, acutish: corollas 3.8–4.3 mm. long: achenes papillose, 1–1.2 mm. long: longer pappus-bristles 4.5–5 mm. long: staminate plant unknown.—RHODORA, xvi. 131 (1914).—Cold north-facing limestone sea-cliffs east of Bic, Rimouski Co., QUEBEC. Fl. July.

11. *A. isolepis* Greene. FIG. 7. Humifuse, the leafy stolons up to 7 cm. long: rosette-leaves oblanceolate or obovate, subacute or obtuse, short mucronate, 0.8–2.5 cm. long, 2–7 mm. broad, densely white-tomentose above: flowering stems 0.7–2.5 dm. high, flexuous: caudine leaves 9–18, linear-oblanceolate, tomentose, 1.5–3 cm. long, 2–4 mm. broad; the lower with subulate tips; the 5–8 upper with broad flat scarious tips: heads 5–9, corymbose: pistillate involucres 6–8 mm. high: bracts of about 3 lengths, fuscous except for the oblong erose white or whitish widely spreading petal-like tips: corollas 3–3.7 mm. long: achenes sparingly papillose, 1–1.2 mm. long: longest pappus-bristles 4.5–5.5 mm. long: staminate plant unknown.—OTTAWA NAT. xxv. 41 (1911).—Coast of Hudson Strait, UNGAVA DISTRICT, and south near the outer coast at least to Port Manvers, LABRADOR. Fl. July, August.

#### EXPLANATION OF PLATE 142.

FIG. 1, *Antennaria alpina* × 1; 1a, tip of median caudine leaf × 4. FIG. 2, *A. Sornborgeri* × 1; 2a, tip of median caudine leaf × 4. FIG. 3, *A. cana* × 1; 3a, tip of median caudine leaf × 4. FIG. 4, *A. vexillifera* × 1; 4a, tip of median caudine leaf × 4. FIG. 5, *A. pygmaea* × 1; 5a, tip of median caudine leaf × 4. FIG. 6, *A. albicans* × 1; 6a, tip of median caudine leaf × 4; 6b, inner bract of involucre × 4. FIG. 7, *A. isolepis* × 1; 7a, tip of median caudine leaf × 4. FIG. 8, *A. straminea* × 1; 8a, tip of median caudine leaf × 4. FIG. 9, *A. nitida* × 1; 9a, tip of median caudine leaf × 4; 9b, inner bract of involucre of staminate plant × 4. FIG. 10, *A. subviscosa* × 1; 10a, tip of median caudine leaf × 4; 10c, central flower and achene × 4. FIG. 11, *A. Peasei* × 1; 11a, tip of median caudine leaf × 4; 11c, central flower and achene × 4.

III. THE EASTERN AMERICAN REPRESENTATIVES OF  
ARNICA ALPINA.

(Plate 143.)

IN 1905 I published<sup>1</sup> a synopsis of the species of *Arnica* known in northeastern America and at that time predicted that "doubtless many other species will be found, especially on the mountains and cliffs of eastern Quebec." Although the prediction has not yet been wholly fulfilled, two very distinct new species have been discovered, one on the Long Range of western Newfoundland, the other in the Shickshock Mountains. In determining the exact relationships of one of these plants, discovered in 1923 on Mt. Logan and the neighboring Mt. Mattaouisse in Matane County, Quebec, it has seemed appropriate to present a new treatment of the eastern species with few and small cauline leaves and with white and merely barbellate pappus (*A. alpina* and its allies) and to publish Miss Brackett's drawings of these species. In order to show the contrast between these plants and the well known *A. mollis* Hook. of the Rocky Mountains and of the Gaspé Peninsula and of northern New England and northern New York, the latter species is also included in the key, although it seems unnecessary to discuss it in detail.

- a. Stem-leaves 1–4 pairs (sometimes scattered small bracts above), at least the upper entire or only sparingly toothed: pappus white or whitish; its bristles merely barbellate b.
- b. Achenes copiously hirsute from base to summit c.
- c. Lower leaves entire or with only remote irregular teeth d.
- d. Base of involucre and summit of peduncle villous-lanate e.
- e. Leaves nearly glabrous or only minutely glandular-hispid: involucral bracts 15–20, narrowly lanceolate, 2–3 mm. broad, only sparingly pubescent above the middle: ligules with blunt lobes only 1–2 mm. long..... 1. *A. alpina*.
- e. Leaves loosely villous: involucral bracts 8–10, narrowly rhombic, 3–3.5 mm. broad, loosely villous to the tip: ligules with acutish lobes 3–5 mm. long..... 2. *A. pulchella*.
- d. Base of involucre and summit of peduncle viscid-villous but hardly lanate f.
- f. Leaves glabrous or merely minutely pilose on nerves and margin, entire; the cauline lanceolate to oblong: stem glabrous or essentially so at base: involucral bracts oblanceolate, 1 cm. long, glandular-villous at base, only sparingly pilose or glabrate above: ligules with blunt lobes only 1–2 mm. long..... 3. *A. plantaginea*.
- f. Leaves glandular-puberulent and viscid-villous, irregularly dentate; the cauline linear or linear-

<sup>1</sup> RHODORA, vii. 146–150 (1905).

- lanceolate: stems viscid-villous at base: involucral bracts linear- to lance-attenuate, 1.2–1.5 cm. long, uniformly viscid-villous: ligules with acutish lobes 3–5 mm. long.....4. *A. Sornborgeri*.
- c. Lower leaves regularly dentate *g.*
- g.* Disk-corollas 6–8 mm. long, with glabrous or only sparingly setose lobes; the densely pilose portion of the tube and throat 3.5–6 mm. long: mature pappus 5–8 mm. long, bright-white.....5. *A. chionopappa*.
- g.* Disk-corollas 9–10 mm. long, with copiously setose lobes; the densely pilose portion of the tube and throat 7–9 mm. long: mature pappus 9–10 mm. long, creamy-white.....6. *A. gaspensis*.
- b.* Achenes glabrous or nearly so below the middle.....7. *A. Griscomi*.
- a.* Stem-leaves 3–5 pairs, all evenly dentate: pappus yellowish-brown or olive-tinged; its bristles subplumose.....8. *A. mollis*.

1. *A. ALPINA* Olin & Ladau. FIG. 1. *Stem 0.5–3 dm. high, sparingly short-villous below, densely so above, copiously villous-lanate at tip: leaves nearly glabrous or minutely glandular hispid; the basal linear-lanceolate, 3–9 cm. long, 0.4–1.6 cm. broad, entire or with few remote small teeth; cauline 1–3 pairs, entire, sessile, the lowest usually much longer than the reduced upper ones: heads solitary (rarely 2–4), 4–6 cm. broad: involucre densely villous-lanate at base; its 15–20 narrowly lanceolate long-acuminate usually purplish bracts only sparingly pubescent above the middle, 1.2–1.5 cm. long, 2–3 mm. broad: ligules 10–15, with 3 blunt lobes 1–2 mm. long: achenes hirsute: pappus cream-white; its bristles barbellate.*—Diss. 11 (1799), acc. to Ind. Kew. *A. montana*,  $\beta$  *alpina* L. Sp. Pl. ii. 884 (1753). *A. angustifolia* Vahl, Fl. Dan. ix. t. 1524 (1818).—Arctic regions, south to rocky slopes of the Torngat Mts., Labrador, Mosquito Bay, Ungava Distr., northern Manitoba, and Alaska; arctic and alpine Eurasia. Fl. August.

2. *A. PULCHELLA* Fernald. FIG. 2. *Stem 1–1.8 dm. high, villous, especially above, with white hairs 1–2 mm. long mixed with minute stipitate glands: leaves loosely villous on both surfaces; the basal lanceolate or oblanceolate, 3–15 cm. long, 0.5–1.5 cm. broad, entire or remotely callos-dentate; cauline 1–2 pairs, entire: head solitary, 4.5 cm. broad: involucre densely villous-lanate at base; its 8–10 narrowly rhombic long-attenuate bracts glandular and loosely villous to the tip, 1.5 cm. long, 3–3.5 mm. broad: ligules about 10, with 3–4 sharp lobes (the longest 3–5 mm. long): achenes hirsute: pappus white, barbellate.*—RHODORA, xvii. 18 (1915).—Dry exposed limestone ledges and shingle, Table Mt., Port à Port Bay, Newfoundland. Fl. July.

3. *A. PLANTAGINEA* Pursh. FIG. 4. *Stem 1.5–4.5 dm. high, glabrous or only very sparingly villous-hispid below, glandular-puberulent at summit: leaves glabrous or minutely pilose on the nerves and margins, entire; the basal oblong to oblanceolate, 0.6–1 dm. long, 1.2–2 cm. broad; cauline 3–4 pairs, sessile, the lower 7–13 cm. long, the upper much reduced: heads 1–3, 4–5 cm. broad: involucre glandular-villous at*

base; its 10–12 ob lanceolate bracts 1 cm. long, sparingly pilose or glabrate above the base: ligules 10–15, with 3 blunt lobes 1–2 mm. long: achenes hispid: pappus white, barbellate.—Fl. 527 (1814); Fernald, RHODORA, vii. 147 (1905). *A. angustifolia* Torr. & Gray, Fl. ii. 449 (1843), in part, not Vahl. *A. alpina* Gray, Syn. Fl. i. pt. 2: 382 (1886), in part, not Olin & Ladau. *A. alpina*, var. *Lessingii* Fernald & Sornborger, Ott. Nat. xiii. 106 (1899), in part, not Gray.—Banks of mountain-brooks, etc., Ramah to Nain, Labrador, west to Kooksoak River, Ungava District. Fl. August.

4. A. SORBORGERI Fernald. FIG. 3. Stem 1.5–2 dm. high, viscid-villous throughout, densely so at summit: leaves glandular-puberulent and viscid-villous, irregularly dentate; the basal linear-lanceolate to narrowly oblong, 6–9 cm. long, 0.8–1.6 cm. broad; caudine 3 pairs, linear to lanceolate: head solitary, 4.5–6 cm. broad: involucre uniformly viscid-villous throughout; its 10–12 linear- to lance-attenuate bracts 1.2–1.5 cm. long: ligules 10–15, with acutish lobes 3–5 mm. long: achenes hirsute: pappus white, barbellate.—RHODORA, vii. 147 (1905).—Rocky banks of streams, Torngat Mts., Labrador. Fl. August, September.

5. A. CHIONOPAPPA Fernald. FIG. 5. Stem 0.7–4 dm. high, loosely or sparingly villous: leaves sparingly villous or glabrate; the basal lanceolate to narrowly ovate, regularly dentate, 0.3–1.8 dm. long, 0.5–3.3 cm. broad; caudine 2–4 pairs, the lower slender-petioled and resembling the basal, the upper sessile and much smaller: heads 1–4, 3–4 cm. broad: involucre villous throughout; the 10–15 linear- to lance-attenuate bracts 7–13 mm. long: ligules 10–15, with short bluntish lobes: disk-corollas 6–8 mm. long, with glabrous or only sparingly setulose lobes; the densely pilose portion of the tube and throat 3.5–6 mm. long: achenes densely short-setulose, 4–6 mm. long; the ascending white hairs about equaling one-half the diameter of the achene: pappus bright-white, in fruit 5–8 mm. long.—RHODORA, vii. 148 (1905).—Calcareous ledges, shingle, cliffs and river-gorges, Table Mt., Port à Port Bay, Newfoundland; Cap-Rosier, Gaspé Co., Quebec to the Tobique River, New Brunswick. Fl. late June–early August.

6. A. GASPENSIS Fernald. FIG. 6. Stem 3–4 dm. high, villous below, glandular-puberulent above: leaves sparingly pilose on both surfaces, lanceolate; the lower with sharp spreading teeth, 6–12 cm. long, 1.2–2.3 cm. broad; the 3 or 4 pairs of caudine sessile, the upper much reduced: heads 1–4, 4–5 cm. broad: involucre glandular puberulent and sparingly pilose; its 8–10 oblong bracts 1 cm. long, with triangular tips: ligules about 10, sharply lobed: disk-corollas slenderly funneliform, 9–10 mm. long, with copiously setose lobes; the densely pilose portion of the tube and throat 7–9 mm. long: achenes hirsute with short and long hairs, the latter nearly equaling the diameter of the achene: pappus cream-white, in fruit 9–10 mm. long.—RHODORA, vii. 148 (1905).—Calcareous ledges and cliffs, Cap Tourelle, Gaspé Co., Quebec. Fl. July.

7. A. Griscomi, n. sp. (FIG. 7), rhizome gracile 0.4–1 dm. long

horizontali vel oblique adscendente; caule solitario (rarissime 2-3) piloso supra sparse villoso-hirsuto 0.8-2.5 dm. alto; foliis rosulatis lanceolato-ellipticis 3-10 cm. longis 0.5-2 cm. latis subacuminatis basi angustis plus minusve petiolatis supra papillosis vel sparsissime villosis glabratisque ciliatis margine calloso-serratis, dentibus 3-7-jugis; foliis caulinis 1-2-jugis, inferioribus oblanceolatis vel oblongis vel lanceolato-ovatis remote serratis vel integris glabris vel papillois, superioribus valde reductis apice calloso-subulatis; pedunculis 1-3 nudis vel bracteolatis, bracteolis linearibus apice subulati-filiformibus; capitulis 2.5-4 cm. diametro; involucro 1-1.5 cm. alto basi minute piloso supra glabro; bracteis 8-10 anguste rhomboideis 2-3 mm. latis acuminatis ciliatis dorso glabris, paginis interioribus apice villosis; ligulis 9-12 luteis, lamina 1-1.5 cm. longa 4-5 mm. lata 7-9-nervata apice 3-dentata, dentibus longioribus 0.5-1 mm. longis; corollis disci 6-7 mm. longis, tubo villoso 2.5-3.5 mm. longo; achaeniis 3-3.5 mm. longis glabris vel ad apicem sparse breviterque hirsutis; pappo 6-7 mm. longo albo, setis barbellulatis.—Matane County, QUEBEC: moist rock-walls and shelves of hornblende-schist at head (altitude about 1070 m.) of Big Chimney, Mt. Mattaouisse, July 8, 1923, M. L. Fernald, Ludlow Griscom, K. K. Mackenzie, A. S. Pease & L. B. Smith, no. 26,082; same station, August 20, 1923, Fernald & Smith, no. 26,085; dry schistose crests and talus of Razorback Ridge (altitude 850-1000 m.), Mt Logan, July 13, 1923, Pease & Smith, no. 26,083; cold chimneys in the schist at about 900-1000 m. altitude, south of Fernald Pass, Mt. Mattaouisse, August 20, 1923, Fernald & Smith, no. 26,084 (TYPE in Gray Herb.).

Named for Ludlow Griscom, professional ornithologist, keen amateur botanist, tireless explorer and choice companion, who first discovered the plant which subsequently proved to be somewhat generally distributed on the cold walls of Mts. Mattaouisse and Logan.

*Arnica Griscomi* belongs to the group of species nearly related to *A. alpina*. From all of them it is distinguished by its achenes being glabrous at base or often nearly throughout; *A. alpina*, *A. plantaginea*, *A. chionopappa*, *A. gaspensis* and *A. arnoglossa* Greene, the five species to which it is most nearly related, having the achenes densely hirsute with comparatively long trichomes. In *A. alpina*, furthermore, the entire basal leaves are very narrow, and the involucre is densely lanate at base and it has more numerous and narrower bracts. *A. chionopappa* has the more numerous linear- or lance-attenuate bracts villous throughout, the ligules more numerous, the villous portion of the disk-corolla longer, and the achenes longer; *A. plantaginea* has the stem glabrous or essentially so at base but distinctly glandular above and its leaves are entire; *A. gaspensis* (which is

known only at the type-station where it has thrice been collected) has the involucral bracts glandular as well as pilose, its disk-corollas slender and longer than in others of the group and with the villous tube more than twice as long as in *A. Griscomi*, its achenes nearly twice as long and its pappus creamy- or sordid-white instead of snow-white. *A. arnoglossa*, described from the Black Hills, is densely glandular-puberulent above and the very young achenes (the only ones seen) are definitely longer than the mature ones of *A. Griscomi*.

#### EXPLANATION OF PLATE 143.

FIG. 1, *Arnica alpina*  $\times$  1; 1a, disk-flowered  $\times$  4; 1b, tip of ligule  $\times$  4. FIG. 2, *A. pulchella*  $\times$  1; 2b, tip of ligule  $\times$  4. FIG. 3, head of *A. Sornborgeri*  $\times$  1. FIG. 4, *A. plantaginea*  $\times$  1. FIG. 5, *A. chionopappa*  $\times$  1; 5a, disk-flower  $\times$  4. FIG. 6a, disk-flower of *A. gaspensis*  $\times$  4. FIG. 7, *A. Griscomi*  $\times$  4; 7a, disk-flower  $\times$  4.

(To be continued)

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## REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XLVI.

### COMPOSITAE.

#### FLAVERIA.

*F. BIDENTIS* (L.) Ktze. On woolwaste, Westford (*Miss E. F. Fletcher*, Oct. 6, 1913). Specimen in herb. Gray. Adventive from South America.

#### GALINSOGA.

*G. CILIATA* (Raf.) Blake. (*G. parviflora* Cav., var. *hispida* DC.; *G. aristulata* Bicknell. See RHODORA xxiv. 34, 1922; Bull. Torr. Bot. Club xlvi. 270–271, 1916). A weed in rich soil; common, especially in the cities.

*G. BICOLORATA* St. John & White. RHODORA xxii. 97–101, 1920. Shore of Charles River, Cambridge (*F. S. Collins*, Sept. 26, 1916). Specimen in herb. N. E. Botanical Club.

*G. CARACASANA* (DC) Sch. Bip. Weed in Botanic Garden, Cambridge (*M. L. Fernald*, Sept. 14, 1909).

*G. PARVIFLORA* Cav. A weed in rich soil; frequent in and near Boston.

### GNAPHALIUM.

**G. decurrens** Ives. Dry soil, occasional from Blue Hills northward.

**G. obtusifolium** L. (*G. polycephalum* Michx. See RHODORA XX. 71-73, 1918.) Dry fields, pastures and beaches, very common throughout.

**G. PURPUREUM** L. Ipswich (*J. A. Lowell*, no date); dump, Lowell (*C. W. Swan*, Aug. 6, 1884).

**G. uliginosum** L. Weed in rich moist soil, common.

### GRINDELIA.

**G. ROBUSTA** Nutt. Colburn's mill yard, Lowell (*C. W. Swan*, 1885). Specimen in herb. N. E. Botanical Club. Native on the Pacific coast of the United States.

### HELENIUM.

**H. AUTUMNALE** L. Merrimac River, Essex County (*Miss Prince*, October, 1887). Specimen in herb. Boston Soc. Nat. Hist.

**H. NUDIFLORUM** Nutt. A rare waif at Andover, Concord, Sherborn and Duxbury.

**H. TENUIFOLIUM** Nutt. Introduced, probably with wool, rare; Georgetown, Malden, Danvers, S. Boston.

### HELIANTHUS.

**H. ANNUUS** L. Vacant lots and dumps, especially near the cities; frequent and variable.

**H. divaricatus** L. Dry open woods and roadsides, common.

**H. DEBILIS** Nutt., var. *CUCUMERIFOLIUS* Gray. Waste ground, Fenway, Boston (*A. S. Pease*, Oct. 10, 1906). Specimen in herb. N. E. Botanical Club. Native from Texas westward.

**H. decapetalus** L. A plant of rich alluvial soil; Georgetown (*Mrs. C. N. S. Horner*, 1876); Tewksbury (*C. W. Swan*, July 7, 1883); reported from Lowell, Medford and Malden in Dame & Collins, Fl. Middlesex Co. 52, 1888.

**H. GIGANTEUS** L. Melrose (*T. Morong*, 1876); grove on Center St., Milton (*N. T. Kidder*, Sept. 8, 1918).

**H. GROSSESERRATUS** Martens. By brook at west base of Zion's Hill, Woburn (*M. L. Fernald*, September, 1899); escape at Needham (*J. R. Churchill*, Aug. 31, 1901); rubbish, edge of salt-marsh, Milton

(*N. T. Kidder*, Sept. 11, 1921); Bellingham (*F. W. Hunnewell*, no date).

**H. LAETIFLORUS** Pers. Marsh back of Stillman Infirmary, Charles River, Cambridge (*W. Deane*, Sept. 7, 1913); sparingly escaped, Hingham (*C. H. Knowlton*, Sept. 5, 1909).

**H. MAXIMILIANI** Schrad. Sandy field by Wright's Pond, Middlesex Fells, Medford, spreading (*F. S. Collins*, Aug. 29, 1909, Sept. 7, 1910).

**H. PETIOLARIS** Nutt. Woollen mill, Graniteville, Westford (*C. W. Swan*, Sept. 15, 1884); railway embankment, Dedham (*C. E. Faxon*, Oct. 2, 1898).

**H. SCABERRIMUS** Ell. Waste places, rare; Boston, Brookline, W. Roxbury, Milton.

**H. strumosus** L. Borders of woods in rich soils, common.

**H. TUBEROSUS** Michx. Old gardens and waste places, occasional.

### HELIOPSIS.

**H. SCABRA** Dunal. A waif in fields at Medford, Sherborn and Lincoln.

### HEMIZONIA.

**H. FASCICULATA** (DC) T. & G. Sown by wool refuse, N. Chelmsford (*W. P. Alcott*, July 1, 1879). Specimens in herb. N. E. Botanical Club and Peabody Acad. Sci.

### HIERACIUM.

**H. AURANTIACUM** L. Fields and waste places, occasional.

**H. canadense** Michx. Borders of woods and other dry places, common throughout.

**H. FLORENTINUM** All. Dry soil, rare; Brookline, Newton, Wellesley Hills, Milton, Quincy.

**H. Gronovii** L. Dry sandy soil, rare; Natick, Norwood, Scituate, Pembroke, Duxbury, Easton.

**H. mariannum** Willd. Open woods, rare; Natick, Stony Brook, and Blue Hills Reservations southward. An early-blooming plant, not too distinct from *H. scabrum*.

**H. paniculatum** L. Open woods, frequent.

**H. paniculatum** L., forma **glandulosum** Hoffm. *RHODORA* xix. 37, 1917. Jamaica Plain (*E. & C. E. Faxon*, June 26, 1889); W. Roxbury (*E. & C. E. Faxon*, July 1, 1890); Blue Hills, Milton (*E. &*

*C. E. Faxon*, July 22, 1889); shaded bank, border of bog, Natick (*J. P. Bill & F. W. Grigg*, Aug. 12, 1922).

**H. PILOSELLA** L. Grassland, Dorchester (*J. R. Churchill*, June 27, 1912); Wellesley (*F. W. Hunnewell*, no date); Milton (*N. T. Kidder*, May 22, 1896).

**H. PILOSELLA** L., var. **VIRIDE** Ser. Spreading in field, Walker St., Cambridge (*M. L. Fernald*, June 6, 1894, June 6, 1895). Specimens in herb. Gray.

**H. PRAEALTUM** Gochnat, var. **DECIPiens** Koch. Dry pasture, spreading, Andover (*A. S. Pease*, June 1, 1902 to June 12, 1904). Specimens in herb. Gray and N. E. Botanical Club.

**H. scabrum** Michx. Dry woods and roadsides, common throughout.

**H. SUBRHOMBOIDEUS** Rydberg. (*Memoirs New York Bot. Garden*, i. 419, 1900). Shady roadside, Sharon (*J. P. Bill & F. W. Grigg*, Aug. 25, 1922). Native of Montana.

**H. venosum** Michx. Dry woods and fields; common throughout, but very few records from Essex County.

**H. venosum** Michx., var. **subcaulescens** T. & G. Waltham (*F. S. Collins*, June 17, 1886); Jamaica Plain (*E. & C. E. Faxon*, June 23, 1889); woodpath, Blue Hill Res. (*W. P. Rich*, June 9, 1895).

**H. VULGATUM** Fries. Border of wood, W. Roxbury (*F. G. Floyd*, July 1, 1915); sparingly introduced in Milton (*G. G. Kennedy*, July 9, 1901; other collections by different collectors to 1919).

### HYPOCHAERIS.

**H. GLABRA** L. Woolwaste, N. Chelmsford (*W. P. Alcott*, 1878). Specimen in herb. Peabody Acad. Sci.

### INULA.

**I. HELENIUM** L. Moist roadsides and pastures, occasional.

**I. SALICINA** L. Introduced near carpet factory, now eradicated, Tapleyville, Danvers (*J. H. Sears*, Aug. 8, 1879). Specimen in herb. Peabody Acad. Sci.

### IVA.

**I. oraria** Bartlett. Salt-marshes, common all along the coast.

**I. XANTHIFOLIA** Nutt. Vacant lots and waste places; Danvers, Cambridge, S. Boston, Woburn, Milton, Wellesley.

## KRIGIA.

[*K. amplexicaulis* Nutt. Reported from wet meadow, Framingham, in RHODORA i. 97, 1899, but no specimen is available.]

**K. virginica** (L.) Willd. Dry fields and open woods, common.

## LACTUCA.

**L. canadensis** L. See RHODORA xxii. 10–11, 1920, for revision of this species and its varieties and forms which follow. Moist soil, common.

**L. canadensis** L., var. **integrifolia** (Bigelow) Gray. Occasional.

**L. canadensis** L., var. **integrifolia** (Bigelow) Gray, forma **angustata** Wiegand. Sandy sea-beach, Pemberton (Hull) (*B. L. Robinson*, Aug. 27, 1897). Specimen in herb. Gray.

**L. canadensis** L., var. **latifolia** O. Kuntze. Occasional north and west of Boston.

**L. canadensis** L., var. **latifolia** O. Kuntze, forma **exauriculata** Wiegand. Rare; Wenham (type station), Revere, Winchester, Dorchester.

**L. canadensis** L., var. **obovata** Wiegand. Occasional, but few records inland (type from Wellesley).

**L. canadensis** L., var. **obovata** Wiegand, forma **stenopoda** Wiegand. Salisbury (*A. A. Eaton*, Aug. 20, 1899). Specimen in herb. N. E. Botanical Club.

**L. canadensis** L., forma **angustipes** Wiegand. Beaver Brook Reservation (*N. T. Kidder*, Aug. 9, 1919); Needham (*T. O. Fuller*, Aug. 14, 1893).

**L. hirsuta** Muhl. Dry fields and woods, rare.

**L. Morssii** Robinson. W. Medford (*C. H. Morss*, Oct. 4, 1902); Green Harbor, Marshfield, reclaimed salt-marsh (*C. H. Morss*, Aug. 14, 1898, Aug. 22, 1899); gravelly soil, W. Roxbury, one plant (*N. T. Kidder*, Sept. 25, 1919).

**L. SCARIOLA** L. Waste land, Lowell (*C. H. Knowlton*, Sept. 12, 1902). Specimen in herb. C. H. Knowlton.

**L. SCARIOLA** L., var. **INTEGRATA** Gren. & Godr. Waste places, occasional; especially abundant around Boston and Cambridge.

**L. spicata** (Lam.) Hitchc. Low ground, frequent throughout.

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WALTER DEANE      }      Local Flora.

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*Vol. 26, no. 304, including pages 61 to 88 and plates 140 and 141, was issued  
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